

# Curriculum Vitae

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## Brief Bio

I hold a PhD in Nuclear Physics from Aarhus University, Denmark. For more than ten years, I was a frequent visitor at large international accelerator laboratories such as CERN in Switzerland where I led a number successful experimental collaborations, which have advanced our understanding of the nuclear processes that generate energy and transmute chemical elements in the interiors of stars. Eager to put my knowledge and analytical skills to use in a more applied setting, I joined the MERIDIAN project in 2018. Based at the Institute for Big Data Analytics at Dalhousie University, Canada, I am now leading a small team of data scientists and software developers in creating novel data analytics and modeling tools for use in underwater acoustics.

## Employment History

2020–Present: Senior Staff Scientist at Institute for Big Data Analytics, Dalhousie University  
2019–Present: Adjunct Professor at Faculty of Computer Science, Dalhousie University  
2018–2020: Lead Acoustic Data Analyst at Institute for Big Data Analytics, Dalhousie University  
2015–2018: Assistant Professor at Department of Physics and Astronomy, Aarhus University  
2013–2015: Postdoc at Department of Physics and Astronomy, Aarhus University  
2010–2013: Postdoc at TRIUMF

## University Education

2006–2010: PhD Physics, Aarhus University  
2005–2006: Fulbright student, University of Washington  
2002–2005: BSc Physics and Mathematics, Aarhus University

## Grants and Awards<sup>1</sup>

2019: NVIDIA Accelerated Data Science GPU Grant, 3k  
2015–2018: “Nuclear astrophysics at the precision frontier”, The Villum Foundation Young Investigator Programme, 580k  
2010–2012: “Experiments in nuclear astrophysics with radioactive beams at the ISAC-II facility at TRIUMF”, The Villum Foundation Postdoc Fellowship, 190k  
2007: Foreign Graduate Student Invitation Program Grant, Tokyo Institute of Technology, Japan  
2005: The Danish-American Fulbright Commission, 17k  
2005: Nordea Danmark-fonden, 4.0k  
2005: Faculty of Science, Aarhus University, 1.9k  
2005: Etatsråd CG Filtenborg og Hustru Marie Filtenborgs Studielegat, 1.0k  
2005: Observator mag.scient Julie Marie Vinter Hansens Rejselegat, 1.0k  
2002: International Physics Olympiad Honorable Mention

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<sup>1</sup>Grant amount in CAD

## Publications

38 peer-reviewed research articles (13 first authorships), 23 conference proceedings, and 3 feature articles. 469 citations (377 without self citations), *h*-index of 12, and 8.23 citations per item.<sup>2</sup> A few key publications are listed below. For a complete list, see page 4.

- O. S. Kirsebom, *et al.*, 2020. *Performance of a deep neural network at detecting North Atlantic right whale upcalls*, The Journal of the Acoustical Society of America **147**, 2636–2646. Citations: 0
- O. S. Kirsebom, *et al.*, 2019. *Discovery of an Exceptionally Strong  $\beta$ -Decay Transition of  $^{20}\text{F}$  and Implications for the Fate of Intermediate-Mass Stars*, Physical Review Letters **123**, 262701. Citations: 0
- O. S. Kirsebom, *et al.*, 2018. *First Accurate Normalization of the  $\beta$ -delayed  $\alpha$  Decay of  $^{16}\text{N}$  and Implications for the  $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$  Astrophysical Reaction Rate*, Physical Review Letters **121**, 142701. Citations: 1
- O. S. Kirsebom, *et al.*, 2012. *Improved Limit on Direct  $\alpha$  Decay of the Hoyle State*, Physical Review Letters **108**, 202501. Citations: 50
- O. S. Kirsebom and B. Davids, 2011. *One fewer solution to the cosmological lithium problem*, Physical Review C **84**, 058801. Citations: 35
- O. S. Kirsebom, *et al.*, 2011. *Precise and accurate determination of  $^8\text{B}$  decay spectrum*, Physical Review C **83**, 065802. Citations: 18
- O. S. Kirsebom, *et al.*, 2010. *Breakup of  $^{12}\text{C}$  resonances into three  $\alpha$  particles*, Physical Review C **81**, 064313. Citations: 51
- O. S. Kirsebom, *et al.*, 2009. *Observation of  $\gamma$ -delayed  $3\alpha$  breakup of the 15.11 and 12.71 MeV states in  $^{12}\text{C}$* , Physics Letters B **680**, 44–49. Citations: 21

## Software

- 2020: *kadlu*, [docs.meridian.cs.dal.ca/kadlu/](https://docs.meridian.cs.dal.ca/kadlu/), M. Smith and O. S. Kirsebom
- 2019: *ketos*, [docs.meridian.cs.dal.ca/ketos/](https://docs.meridian.cs.dal.ca/ketos/), F. Frazao and O. S. Kirsebom
- 2018: *simX*, [10.5281/zenodo.1320121](https://doi.org/10.5281/zenodo.1320121), M. Munch and J. H. Jensen and O. S. Kirsebom
- 2018: *Open R-matrix (ORM)*, [10.5281/zenodo.1174079](https://doi.org/10.5281/zenodo.1174079), M. Munch and O. S. Kirsebom and J. Refsgaard

## Talks

Numerous (> 50) presentations at international conferences and workshops including several invited talks. For a complete list, see [oliskir.github.io](https://oliskir.github.io).

## Spokespersonships (P.I.)

- 2015–2018: *Search for the 2nd-forbidden ground-state transition in the  $\beta$  decay of  $^{20}\text{F}$* , JYFL
- 2015–2018: *Absolute measurement of the  $\beta\alpha$  decay of  $^{16}\text{N}$* , ISOLDE
- 2012–2015:  *$\beta$ -delayed  $\alpha$ -decay study of  $^{16}\text{N}$  using the implantation method*, KVI
- 2011–2015: *Lifetime Measurement of the 7.786 MeV State in  $^{23}\text{Mg}$* , TRIUMF

## Teaching

- 2013–2017: Extracurricular programme for 1st-year students, Coordinator
- 2015: Nuclear astrophysics graduate course, Lecturer
- 2014: Electromagnetism laboratory course, Coordinator
- 2006–2010: Physics and mathematics undergraduate courses, Teaching Assistant

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<sup>2</sup>Source: Web of Science, 2020.01.03.

## Student Supervision

2019–2020: Xuhui Liu, MSc Computer Science, Dalhousie University (co-supervisor)

2016–2017: Helle Bisgaard Sørensen, MSc Physics, Aarhus University

2014–2015: Sofie Tilbæk Nielsen, BSc Physics, Aarhus University

## Conference and Workshop Organization

21–22 Nov 2019: Organizer of the workshop “**Detection and Classification in Marine Bioacoustics with Deep Learning**” with approx. 30 participants from Canada, the U.S. and Europe.

## Academic Services

2016–2018: Member of the Liaison Committee at the Department of Physics and Astronomy, Aarhus University

## Refereeing

Physics Review Letters, Physical Review C, The Astrophysical Journal, Hyperfine Interactions, Methods in Ecology and Evolution.

## Professional Memberships

2018–Present: Member of the Canadian Acoustical Association

2013–2018: Member of the Danish Physical Society

# Publications

## Research Articles

- O. S. Kirsebom, F. Frazao, Y. Simard, N. Roy, S. Matwin, and S. Giard. *Performance of a deep neural network at detecting North Atlantic right whale upcalls*. The Journal of the Acoustical Society of America **147**, 2636–2646 (2020), URL <http://dx.doi.org/10.1121/10.0001132>
- M. Munch, O. S. Kirsebom, J. A. Swartz, and H. O. U. Fynbo. *Resolving the  $^{11}\text{B}(p, \alpha_0)$  cross-section discrepancies between 0.5 and 3.5 MeV*. The European Physical Journal A **56**, 17 (2020), URL <http://dx.doi.org/10.1140/epja/s10050-019-00016-8>
- O. S. Kirsebom, S. Jones, D. F. Strömberg, G. Martínez-Pinedo, K. Langanke, F. K. Röpke, B. A. Brown, T. Eronen, H. O. U. Fynbo, M. Hukkanen, A. Idini, A. Jokinen, A. Kankainen, J. Kostensalo, I. Moore, H. Möller, S. T. Ohlmann, H. Penttilä, K. Riisager, S. Rinta-Antila, P. C. Srivastava, J. Suhonen, W. H. Trzaska, and J. Äystö. *Discovery of an Exceptionally Strong  $\beta$ -Decay Transition of  $^{20}\text{F}$  and Implications for the Fate of Intermediate-Mass Stars*. Phys. Rev. Lett. **123**, 262701 (2019), URL <http://dx.doi.org/10.1103/PhysRevLett.123.262701>
- O. S. Kirsebom, M. Hukkanen, A. Kankainen, W. H. Trzaska, D. F. Strömberg, G. Martínez-Pinedo, K. Andersen, E. Bodewits, B. A. Brown, L. Canete, J. Cederkäll, T. Enqvist, T. Eronen, H. O. U. Fynbo, S. Geldhof, R. de Groote, D. G. Jenkins, A. Jokinen, P. Joshi, A. Khanam, J. Kostensalo, P. Kuusiniemi, K. Langanke, I. Moore, M. Munch, D. A. Nesterenko, J. D. Ovejas, H. Penttilä, I. Pohjalainen, M. Reponen, S. Rinta-Antila, K. Riisager, A. de Roubin, P. Schotanus, P. C. Srivastava, J. Suhonen, J. A. Swartz, O. Tengblad, M. Vilen, S. Vinals, and J. Äystö. *Measurement of the  $2^+ \rightarrow 0^+$  ground-state transition in the  $\beta$  decay of  $^{20}\text{F}$* . Phys. Rev. C **100**, 065805 (2019), URL <http://dx.doi.org/10.1103/PhysRevC.100.065805>
- B. Davids, M. Williams, N. E. Esker, M. Alcorta, D. Connolly, B. R. Fulton, K. Hudson, N. Khan, O. S. Kirsebom, J. Lighthall, and P. Machule. *Initial operation of the recoil mass spectrometer EMMA at the ISAC-II facility of TRIUMF*. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment **930**, 191–195 (2019), URL <http://dx.doi.org/https://doi.org/10.1016/j.nima.2019.03.070>
- O. S. Kirsebom, O. Tengblad, R. Lica, M. Munch, K. Riisager, H. O. U. Fynbo, M. J. G. Borge, M. Madurga, I. Marroquin, A. N. Andreyev, T. A. Berry, E. R. Christensen, P. D. Fernández, D. T. Doherty, P. Van Duppen, L. M. Fraile, M. C. Gallardo, P. T. Greenlees, L. J. Harkness-Brennan, N. Hubbard, M. Huyse, J. H. Jensen, H. Johansson, B. Jonson, D. S. Judson, J. Konki, I. Lazarus, M. V. Lund, N. Marginean, R. Marginean, A. Perea, C. Mihai, A. Negret, R. D. Page, V. Pucknell, P. Rahkila, O. Sorlin, C. Sotty, J. A. Swartz, H. B. Sørensen, H. Törnqvist, V. Vedia, N. Warr, and H. De Witte. *First Accurate Normalization of the  $\beta$ -delayed  $\alpha$  Decay of  $^{16}\text{N}$  and Implications for the  $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$  Astrophysical Reaction Rate*. Physical Review Letters **121**, 142701 (2018), URL <http://dx.doi.org/10.1103/PhysRevLett.121.142701>
- M. Dahl, A. Brun, O. S. Kirsebom, and G. Andresen. *Improving Short-Term Heat Load Forecasts with Calendar and Holiday Data*. Energies **11**, 1678 (2018), URL <http://dx.doi.org/10.3390/en11071678>
- M. Munch, O. S. Kirsebom, J. A. Swartz, K. Riisager, and H. O. U. Fynbo. *Measurement of the full excitation spectrum of the  $^7\text{Li}(p, \gamma)\alpha\alpha$  reaction at 441 keV*. Physics Letters B **782**, 779–784 (2018), URL <http://dx.doi.org/10.1016/j.physletb.2018.06.013>
- J. Refsgaard, H. O. U. Fynbo, O. S. Kirsebom, and K. Riisager. *Three-body effects in the Hoyle-state decay*. Physics Letters B **779**, 414–419 (2018), URL <http://dx.doi.org/10.1016/j.physletb.2018.02.031>
- V. Pseudo, M. J. G. Borge, A. M. Moro, J. A. Lay, E. Nácher, J. Gómez-Camacho, O. Tengblad, L. Acosta, M. Alcorta, M. A. G. Alvarez, C. Andreoiu, P. C. Bender, R. Braid, M. Cubero, A. D. Pietro, J. P. Fernández-García, P. Figuera, M. Fisichella, B. R. Fulton, A. B. Garnsworthy, G. Hackman, U. Hager, O. S. Kirsebom, K. Kuhn, M. Lattuada, G. Marquín-Durán, I. Martel, D. Miller, M. Moukaddam, P. D. O'Malley, A. Perea, M. M. Rajabali, A. M. Sánchez-Benítez, F. Sarazin, V. Scuderi, C. E.

- Svensson, C. Unsworth, and Z. M. Wang. *Scattering of the Halo Nucleus  $^{11}\text{Be}$  on  $^{197}\text{Au}$  at Energies around the Coulomb Barrier*. Physical Review Letters **118**, 152502 (2017), URL <http://dx.doi.org/10.1103/physrevlett.118.152502>
- M. V. Lund, A. Andreyev, M. J. G. Borge, J. Cederkl, H. D. Witte, L. M. Fraile, H. O. U. Fynbo, P. T. Greenlees, L. J. Harkness-Brennan, A. M. Howard, M. Huyse, B. Jonson, D. S. Judson, O. S. Kirsebom, J. Konki, J. Kurcewicz, I. Lazarus, R. Lica, S. Lindberg, M. Madurga, N. Marginean, R. Marginean, I. Marroquin, C. Mihai, M. Munch, E. Nacher, A. Negret, T. Nilsson, R. D. Page, S. Pascu, A. Perea, V. Pucknell, P. Rahkila, E. Rapisarda, K. Riisager, F. Rotaru, C. Sotty, M. Stanoiu, O. Tengblad, A. Turturica, P. V. Duppen, V. Vedia, R. Wadsworth, and N. Warr. *Beta-delayed proton emission from  $^{20}\text{Mg}$* . The European Physical Journal A **52**, 304 (2016), URL <http://dx.doi.org/10.1140/epja/i2016-16304-x>
- K. L. Laursen, H. O. U. Fynbo, O. S. Kirsebom, K. S. Madsbøll, and K. Riisager. *Complete kinematical study of the  $3\alpha$  breakup of the  $16.11\text{ MeV}$  state in  $^{12}\text{C}$* . The European Physical Journal A **52**, 271 (2016), URL <http://dx.doi.org/10.1140/epja/i2016-16271-2>
- M. Munch, M. Alcorta, H. O. U. Fynbo, M. Albers, S. Almaraz-Calderon, M. L. Avila, A. D. Ayangeakaa, B. B. Back, P. F. Bertone, P. F. F. Carnelli, M. P. Carpenter, C. J. Chiara, J. A. Clark, B. DiGiovine, J. P. Greene, J. L. Harker, C. R. Hoffman, N. J. Hubbard, C. L. Jiang, O. S. Kirsebom, T. Lauritsen, K. L. Laursen, S. T. Marley, C. Nair, O. Nusair, D. Santiago-Gonzalez, J. Sethi, D. Seweryniak, R. Talwar, C. Ugalde, and S. Zhu. *Independent measurement of the Hoyle state  $\beta$  feeding from  $^{12}\text{B}$  using Gammasphere*. Physical Review C **93**, 065803 (2016), URL <http://dx.doi.org/10.1103/physrevc.93.065803>
- O. S. Kirsebom, P. Bender, A. Cheeseman, G. Christian, R. Churchman, D. S. Cross, B. Davids, L. J. Evitts, J. Fallis, N. Galinski, A. B. Garnsworthy, G. Hackman, J. Lighthall, S. Ketelhut, P. Machule, D. Miller, S. T. Nielsen, C. R. Nobs, C. J. Pearson, M. M. Rajabali, A. J. Radich, A. Rojas, C. Ruiz, A. Sanetullaev, C. D. Unsworth, and C. Wrede. *Measurement of lifetimes in  $^{23}\text{Mg}$* . Physical Review C **93**, 025802 (2016), URL <http://dx.doi.org/10.1103/physrevc.93.025802>
- J. Refsgaard, O. Kirsebom, E. Dijck, H. Fynbo, M. Lund, M. Portela, R. Raabe, G. Randisi, F. Renzi, S. Sambi, A. Sytoma, L. Willmann, and H. Wilschut. *Measurement of the branching ratio for  $\beta$ -delayed  $\alpha$  decay of  $^{16}\text{N}$* . Physics Letters B **752**, 296–301 (2016), URL <http://dx.doi.org/10.1016/j.physletb.2015.11.047>
- K. L. Laursen, H. O. U. Fynbo, O. S. Kirsebom, K. S. Madsbøll, and K. Riisager. *Unbound states in  $^{12}\text{C}$  populated by  $\gamma$ -decay of the  $(J^\pi, T) = (2^+, 1)$   $16.11\text{ MeV}$  state*. The European Physical Journal A **52**, 370 (2016), URL <http://dx.doi.org/10.1140/epja/i2016-16370-0>
- V. Margerin, G. Lotay, P. J. Woods, M. Aliotta, G. Christian, B. Davids, T. Davinson, D. T. Doherty, J. Fallis, D. Howell, O. S. Kirsebom, D. J. Mountford, A. Rojas, C. Ruiz, and J. A. Tostevin. *Inverse Kinematic Study of the  $^{26}\text{gAl}(d, p)\text{Al}^{27}$  Reaction and Implications for Destruction  $^{26}\text{Al}$  in Wolf-Rayet and Asymptotic Giant Branch Stars*. Physical Review Letters **115**, 062701 (2015), URL <http://dx.doi.org/10.1103/physrevlett.115.062701>
- A. M. Howard, M. Munch, H. O. U. Fynbo, O. S. Kirsebom, K. L. Laursen, C. A. Diget, and N. J. Hubbard.  *$^{23}\text{Na}(\alpha, p)^{26}\text{Mg}$  Reaction Rate at Astrophysically Relevant Energies*. Physical Review Letters **115**, 052701 (2015), URL <http://dx.doi.org/10.1103/physrevlett.115.052701>
- O. S. Kirsebom, H. O. U. Fynbo, K. Riisager, R. Raabe, and T. Roger. *Analysis of the response of silicon detectors to  $\alpha$  particles and  $^{16}\text{O}$  ions*. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment **758**, 57–61 (2014), URL <http://dx.doi.org/10.1016/j.nima.2014.05.005>
- K. L. Laursen, O. S. Kirsebom, H. O. U. Fynbo, A. Jokinen, M. Madurga, K. Riisager, A. Saastamoinen, O. Tengblad, and J. Äystö. *High-statistics measurement of the  $\beta$ -delayed  $\alpha$  spectrum of  $^{20}\text{Na}$* . The European Physical Journal A **49**, 79 (2013), URL <http://dx.doi.org/10.1140/epja/i2013-13079-6>
- M. J. G. Borge, L. M. Fraile, H. O. U. Fynbo, B. Jonson, O. S. Kirsebom, T. Nilsson, G. Nyman, G. Possnert, K. Riisager, and O. Tengblad. *Rare  $\beta p$  decays in light nuclei*. Journal of Physics G: Nuclear and Particle Physics **40**, 035109 (2013), URL <http://dx.doi.org/10.1088/0954-3899/40/3/035109>

- O. S. Kirsebom, M. Alcorta, M. J. G. Borge, M. Cubero, H. O. U. Fynbo, M. Madurga, and O. Tengblad. *Observation of  $\alpha$  decay from a state in  $^{10}\text{B}$  at 11.48 MeV*. Physical Review C **85**, 054308 (2012), URL <http://dx.doi.org/10.1103/physrevc.85.054308>
- O. S. Kirsebom, M. Alcorta, M. J. G. Borge, M. Cubero, C. A. Diget, L. M. Fraile, B. R. Fulton, H. O. U. Fynbo, D. Galaviz, B. Jonson, M. Madurga, T. Nilsson, G. Nyman, K. Riisager, O. Tengblad, and M. Turrión. *Improved Limit on Direct  $\alpha$  Decay of the Hoyle State*. Physical Review Letters **108**, 202501 (2012), URL <http://dx.doi.org/10.1103/physrevlett.108.202501>
- T. Roger, J. Büscher, B. Bastin, O. S. Kirsebom, R. Raabe, M. Alcorta, J. Äystö, M. J. G. Borge, M. Carmona-Gallardo, T. E. Cocolios, J. Cruz, P. Dendooven, L. M. Fraile, H. O. U. Fynbo, D. Galaviz, L. R. Gasques, G. S. Giri, M. Huyse, S. Hyldegaard, K. Jungmann, W. L. Kruithof, M. Lantz, A. Perea, K. Riisager, A. Saastamoinen, B. Santra, P. D. Shidling, M. Sohani, A. J. Sørensen, O. Tengblad, E. Traykov, D. J. van der Hoek, P. V. Duppen, O. O. Versolato, and H. W. Wilschut. *Precise Determination of the Unperturbed  $^8\text{B}$  Neutrino Spectrum*. Physical Review Letters **108**, 162502 (2012), URL <http://dx.doi.org/10.1103/physrevlett.108.162502>
- M. Alcorta, M. J. G. Borge, M. Cubero, C. A. Diget, R. Domínguez-Reyes, L. M. Fraile, B. R. Fulton, H. O. U. Fynbo, D. Galaviz, S. Hyldegaard, H. Jeppesen, B. Jonson, O. S. Kirsebom, M. Madurga, A. Maira, A. Muñoz-Martín, T. Nilsson, G. Nyman, D. Obradors, A. Perea, K. Riisager, O. Tengblad, and M. Turrión. *Properties of  $^{12}\text{C}$  resonances determined from the  $^{10}\text{B}(^3\text{He}, p\alpha\alpha\alpha)$  and  $^{11}\text{B}(^3\text{He}, d\alpha\alpha\alpha)$  reactions studied in complete kinematics*. Physical Review C **86**, 064306 (2012), URL <http://dx.doi.org/10.1103/physrevc.86.064306>
- O. S. Kirsebom and B. Davids. *One fewer solution to the cosmological lithium problem*. Physical Review C **84**, 058801 (2011), URL <http://dx.doi.org/10.1103/physrevc.84.058801>
- O. S. Kirsebom, H. O. U. Fynbo, A. Jokinen, M. Madurga, K. Riisager, A. Saastamoinen, O. Tengblad, and J. Äystö. *New  $\beta$ -delayed proton lines from  $^{23}\text{Al}$* . The European Physical Journal A **47**, 130 (2011), URL <http://dx.doi.org/10.1140/epja/i2011-11130-4>
- O. S. Kirsebom, S. Hyldegaard, M. Alcorta, M. J. G. Borge, J. Büscher, T. Eronen, S. Fox, B. R. Fulton, H. O. U. Fynbo, H. Hultgren, A. Jokinen, B. Jonson, A. Kankainen, P. Karvonen, T. Kessler, A. Laird, M. Madurga, I. Moore, G. Nyman, H. Penttilä, S. Rahaman, M. Reponen, K. Riisager, T. Roger, J. Ronkainen, A. Saastamoinen, O. Tengblad, and J. Äystö. *Precise and accurate determination of  $^8\text{B}$  decay spectrum*. Physical Review C **83**, 065802 (2011), URL <http://dx.doi.org/10.1103/physrevc.83.065802>
- E. Tengborn, A. M. Moro, T. Nilsson, M. Alcorta, M. J. G. Borge, J. Cederkäll, C. Diget, L. M. Fraile, H. O. U. Fynbo, J. Gomez-Camacho, H. B. Jeppesen, H. T. Johansson, B. Jonson, O. S. Kirsebom, H. H. Knudsen, M. Madurga, G. Nyman, A. Richter, K. Riisager, G. Schrieder, O. Tengblad, N. Timofeyuk, M. Turrión, D. Voulot, and F. Wenander. *The  $^8\text{Li} + ^2\text{H}$  reaction studied in inverse kinematics at 3.15 MeV/nucleon using the REX-ISOLDE post-accelerator*. Physical Review C **84**, 064616 (2011), URL <http://dx.doi.org/10.1103/physrevc.84.064616>
- O. S. Kirsebom, M. Alcorta, M. J. G. Borge, M. Cubero, C. A. Diget, R. Dominguez-Reyes, L. M. Fraile, B. R. Fulton, H. O. U. Fynbo, S. Hyldegaard, B. Jonson, M. Madurga, A. M. Martin, T. Nilsson, G. Nyman, A. Perea, K. Riisager, and O. Tengblad. *Breakup of  $^{12}\text{C}$  resonances into three  $\alpha$  particles*. Physical Review C **81**, 064313 (2010), URL <http://dx.doi.org/10.1103/physrevc.81.064313>
- S. Hyldegaard, M. Alcorta, B. Bastin, M. J. G. Borge, R. Boutami, S. Brandenburg, J. Büscher, P. Dendooven, C. A. Diget, P. V. Duppen, T. Eronen, S. P. Fox, L. M. Fraile, B. R. Fulton, H. O. U. Fynbo, J. Huikari, M. Huyse, H. B. Jeppesen, A. S. Jokinen, B. Jonson, K. Jungmann, A. Kankainen, O. S. Kirsebom, M. Madurga, I. Moore, A. Nieminen, T. Nilsson, G. Nyman, G. J. G. Onderwater, H. Penttilä, K. Perjuri, R. Raabe, K. Riisager, S. Rinta-Antila, A. Rogachevskiy, A. Saastamoinen, M. Sohani, O. Tengblad, E. Traykov, Y. Wang, K. Wilhelmsen, H. W. Wilschut, and J. Äystö. *R-matrix analysis of the  $\beta$  decays of  $^{12}\text{N}$  and  $^{12}\text{B}$* . Physical Review C **81**, 024303 (2010), URL <http://dx.doi.org/10.1103/physrevc.81.024303>
- O. S. Kirsebom, M. Alcorta, M. J. G. Borge, M. Cubero, C. A. Diget, R. Dominguez-Reyes, L. Fraile, B. R. Fulton, H. O. U. Fynbo, D. Galaviz, G. Garcia, S. Hyldegaard, H. Jeppesen, B. Jonson, P. Joshi, M. Madurga, A. Maira, A. Muñoz, T. Nilsson, G. Nyman, D. Obradors, A. Perea, K. Riisager, O. Tengblad, and M. Turrión. *Observation of  $\gamma$ -delayed  $3\alpha$  breakup of the 15.11 and 12.71 MeV states in  $^{12}\text{C}$* . Physics Letters B **680**, 44–49 (2009), URL <http://dx.doi.org/10.1016/j.physletb.2009.08.034>



- S. Hyldegaard, C. Forssén, C. Diget, M. Alcorta, F. Barker, B. Bastin, M. Borge, R. Boutami, S. Brandenburg, J. Bscher, P. Dendooven, P. V. Duppen, T. Eronen, S. Fox, B. Fulton, H. Fynbo, J. Huikari, M. Huyse, H. Jeppesen, A. Jokinen, B. Jonson, K. Jungmann, A. Kankainen, O. Kirsebom, M. Madurga, I. Moore, P. Navrátil, T. Nilsson, G. Nyman, G. Onderwater, H. Penttil, K. Perjuri, R. Raabe, K. Riisager, S. Rinta-Antila, A. Rogachevskiy, A. Saastamoinen, M. Sohani, O. Tengblad, E. Traykov, J. Vary, Y. Wang, K. Wilhelmssen, H. Wilschut, and J. Åystö. *Precise branching ratios to unbound  $^{12}\text{C}$  states from  $^{12}\text{N}$  and  $^{12}\text{B}$   $\beta$ -decays.* Physics Letters B **678**, 459–464 (2009), URL <http://dx.doi.org/10.1016/j.physletb.2009.06.064>
- M. Alcorta, O. S. Kirsebom, M. Borge, H. Fynbo, K. Riisager, and O. Tengblad. *A complete kinematics approach to study multi-particle final state reactions.* Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment **605**, 318–325 (2009), URL <http://dx.doi.org/10.1016/j.nima.2009.03.246>
- M. Madurga, M. Borge, M. Alcorta, L. Fraile, H. Fynbo, B. Jonson, O. S. Kirsebom, G. Martínez-Pinedo, T. Nilsson, G. Nyman, A. Perea, A. Poves, K. Riisager, O. Tengblad, E. Tengborn, and J. V. der Walle. *Evidence of a new state in  $^{11}\text{Be}$  observed in the  $^{11}\text{Li}$  beta-decay.* Physics Letters B **677**, 255–259 (2009), URL <http://dx.doi.org/10.1016/j.physletb.2009.05.050>
- H. O. U. Fynbo, R. Álvarez-Rodríguez, A. S. Jensen, O. S. Kirsebom, D. V. Fedorov, and E. Garrido. *Three-body decays and R-matrix analyses.* Physical Review C **79**, 054009 (2009), URL <http://dx.doi.org/10.1103/physrevc.79.054009>
- M. Madurga, M. J. G. Borge, M. Alcorta, L. M. Fraile, H. O. U. Fynbo, B. Jonson, O. S. Kirsebom, T. Nilsson, G. Nyman, A. Perea, K. Riisager, O. Tengblad, E. Tengborn, and J. V. der Walle. *Kinematic identification of the  $\beta t$  branch in the decay of  $^{11}\text{Li}$ .* The European Physical Journal A **42**, 415 (2009), URL <http://dx.doi.org/10.1140/epja/i2008-10769-0>
- R. Álvarez-Rodríguez, A. S. Jensen, E. Garrido, D. V. Fedorov, H. O. U. Fynbo, and O. S. Kirsebom. *Three-Body Decays: Structure, Decay Mechanism and Fragment Properties.* Few-Body Systems **45**, 149–152 (2009), URL <http://dx.doi.org/10.1007/s00601-009-0010-2>

## Feature Articles

- O. Kirsebom, F. Frazao, I. Hessler, and S. Matwin. *Towards Versatile and Adaptive Detection Algorithms in Underwater Acoustics.* The Journal of Ocean Technology **14**, 144–145 (2019)
- O. S. Kirsebom. *Watching the Hoyle State Fall Apart.* Physics **10**, 103 (2017), URL <http://dx.doi.org/10.1103/physics.10.103>
- D. Jenkins and O. S. Kirsebom. *The secret of life.* Physics World **26**, 23–26 (2013), URL <http://dx.doi.org/10.1088/2058-7058/26/02/32>

## Conference Proceedings

- D. Nguyen, O. S. Kirsebom, F. Frazo, R. Fablet, and S. Matwin. *Recurrent Neural Networks with Stochastic Layers for Acoustic Novelty Detection.* In *ICASSP 2019 - 2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pages 765–769. ISSN 2379-190X (2019), URL <http://dx.doi.org/10.1109/ICASSP.2019.8682901>
- J. A. Swartz, H. O. U. Fynbo, K. L. Andersen, M. Munch, and O. S. Kirsebom. *Investigating  $^{16}\text{O}$  via the  $^{15}\text{N}(p, \alpha)^{12}\text{C}$  reaction.* AIP Conference Proceedings **2038**, 020014 (2018), URL <http://dx.doi.org/10.1063/1.5078833>
- R. Garg, C. Barton, C. A. Diget, S. Courtin, G. Fruet, H. O. U. Fynbo, A. Howard, A. Illana, D. G. Jenkins, I. Marroquin, O. S. Kirsebom, M. V. Lund, I. Moore, A. Perea, J. Refsgaard, J. E. Riley, S. Rinta-Antila, L. Sinclair, and O. T. and. *Rotational excitation of the Hoyle state in  $^{12}\text{C}$ .* Journal of Physics: Conference Series **940**, 012043 (2018), URL <http://dx.doi.org/10.1088/1742-6596/940/1/012043>
- O. S. Kirsebom. *Experimental progress in clarifying the excitation spectrum of  $^{12}\text{C}$ .* Journal of Physics: Conference Series **863**, 012018 (2017), URL <http://dx.doi.org/10.1088/1742-6596/863/1/012018>

- M. J. G. Borge, V. Pesudo, E. Nácher, O. Tengblad., M. Cubero., A. Perea, A. M. Moro, J. A. Lay, J. Gómez-Camacho., M. A. G. Alvarez, J. P. Fernandez-Garcia, A. D. Prieto, P. Figuera, M. Fisichella., M. Lattuada., V. Scuderi, G. Marquínez-Durán, I. Martel., A. M. Sánchez-Benítez, M. Alcorta., P. C. Bender, R. Braid., A. B. Garnsworthy, G. Hackman., D. Miller., M. Moukaddam., M. Rajabali., C. Unsworth., Z. Wang, B. R. Fulton, U. Hager, O. Kirsebom, K. Kuhn., P. O'Malley., F. Sarazin, and C. Svensson. *Scattering Of The Halo Nucleus  $^{11}\text{Be}$  On A  $^{197}\text{Au}$  Target At Energies Around The Coulomb Barrier*. In *Proceedings of The 26th International Nuclear Physics Conference — PoS(INPC2016)*. Sissa Medialab (2017), URL <http://dx.doi.org/10.22323/1.281.0207>
- S. Courtin, G. Fruet, D. G. Jenkins, M. Heine, D. Montanari, L. G. Morris, G. Lotay, P. H. Regan, O. S. Kirsebom, S. D. Negra, F. Hammache, N. de Sereville, B. Bastin, F. de Oliveira, G. Randisi, C. Stodel, C. Beck, and F. Haas. *Fusion Cross Sections of Astrophysics Interest Within the STELLA Project*. In *Proceedings of the 14th International Symposium on Nuclei in the Cosmos (NIC2016)*. Journal of the Physical Society of Japan (2017), URL <http://dx.doi.org/10.7566/jpscp.14.021001>
- O. S. Kirsebom, I. M. Alonso, T. Berry, M. J. G. Borge, E. R. Christensen, D. Doherty, P. D. Fernández, M. M. Flores, H. O. U. Fynbo, M. C. Gallardo, N. Hubbard, J. H. Jensen, H. Johansson, B. Jonson, R. Lica, M. V. Lund, A. P. Martínez, M. K. Munch, K. Riisager, O. Sorlin, J. A. Swartz, O. Tengblad, and V. Vedia. *Improved experimental determination of the branching ratio for  $\beta$ -delayed  $\alpha$  decay of  $^{16}\text{N}$* . EPJ Web of Conferences **165**, 01031 (2017), URL <http://dx.doi.org/10.1051/epjconf/201716501031>
- O. S. Kirsebom, J. Cederkäll, D. G. Jenkins, P. Joshi, R. Julin, A. Kankainen, T. Kibédi, O. Tengblad, and W. H. Trzaska. *Towards an Experimental Determination of the Transition Strength Between the Ground States of  $^{20}\text{F}$  and  $^{20}\text{Ne}$* . In *Proceedings of the 14th International Symposium on Nuclei in the Cosmos (NIC2016)*. Journal of the Physical Society of Japan (2017), URL <http://dx.doi.org/10.7566/jpscp.14.021008>
- S. Courtin, C. Jiang, G. Fruet, M. Heine, D. Jenkins, P. Adsley, L. Morris, P. Regan, M. Rudigier, D. Montanari, S. D. Negra, N. de Séréville, F. Haas, F. Hammache, O. Kirsebom, J. Lesrel, A. Meyer, D. Montanari, K. Auranen, M. Avila, A. Ayangeakaa, B. Back, S. Bottoni, M. Carpenter, C. Dickerson, B. DiGiovine, J. Greene, D. Henderson, C. Hoffman, R. Janssens, B. Kay, S. Kuvín, T. Lauritsen, R. Pardo, K. Rehm, D. Santiago-Gonzalez, J. Sethi, D. Seweryniak, R. Talwar, C. Ugalde, S. Zhu, C. Deibel, S. Marley, D. Bourgin, C. Stodel, A. Lefebvre-Schuhl, S. Almaraz-Calderon, X. Fang, X. Tang, M. Alcorta, B. Bucher, M. Albers, and P. Bertone. *Cross section measurements in the  $^{12}\text{C} + ^{12}\text{C}$  system*. EPJ Web of Conferences **165**, 01015 (2017), URL <http://dx.doi.org/10.1051/epjconf/201716501015>
- G. Fruet, S. Courtin, D. G. Jenkins, M. Heine, D. Montanari, L. G. Morris, P. Adsley, C. Beck, S. D. Negra, F. Haas, F. Hammache, O. S. Kirsebom, A. Meyer, P. H. Regan, M. Rudigier, N. de Séréville, and C. Stodel. *Fusion cross section measurements of astrophysical interest for light heavy ions systems within the STELLA project*. EPJ Web of Conferences **163**, 00018 (2017), URL <http://dx.doi.org/10.1051/epjconf/201716300018>
- V. Pesudo, M. J. G. Borge, A. M. Moro, J. A. Lay, E. Nácher, J. Gómez-Camacho, O. Tengblad, L. Acosta, M. Alcorta, M. Alvarez, C. Andreoiu, P. Bender, R. Braid, M. Cubero, A. D. Pietro, J. P. Fernández-García, P. Figuera, M. Fisichella, B. R. Fulton, A. Garnsworthy, G. Hackman, U. Hager, O. S. Kirsebom, K. Kuhn, M. Lattuada, G. Marquínez-Durán, I. Martel, D. Miller, M. Moukaddam, P. D. O'Malley, A. Perea, M. M. Rajabali, A. M. Sánchez-Benítez, F. Sarazin, V. Scuderi, C. E. Svensson, C. Unsworth, and Z. M. Wang. *Scattering of halo nuclei on heavy targets at energies around the Coulomb barrier: The case of  $^{11}\text{Be}$  on  $^{197}\text{Au}$* . EPJ Web of Conferences **163**, 00045 (2017), URL <http://dx.doi.org/10.1051/epjconf/201716300045>
- M. Heine, S. Courtin, G. Fruet, D. Jenkins, D. Montanari, P. Adsley, C. Beck, S. D. Negra, P. Dené, F. Haas, F. Hammache, G. Heitz, O. Kirsebom, M. Krauth, J. Lesrel, A. Meyer, L. Morris, P. Regan, M. Richer, M. Rudigier, N. de Séréville, and C. Stodel. *Sub-barrier fusion cross section measurements with STELLA*. EPJ Web of Conferences **165**, 01029 (2017), URL <http://dx.doi.org/10.1051/epjconf/201716501029>
- I. Marroquin, M. Borge, A. Ciemny, H. de Witte, L. Fraile, H. Fynbo, A. Garzón-Camacho, A. Howard, H. Johansson, B. Jonson, O. Kirsebom, G. Koldste, R. Lica, M. Lund, M. Madurga, C. Mazzocchi,



- C. Mihai, M. Munch, S. Nae, E. Nacher, A. Negret, T. Nilsson, A. Perea, J. Refsgaard, K. Riisager, E. Rapisarda, C. Sotty, M. Stanoiu, O. Tengblad, A. Turturica, and M. Vedia. *Multi-particle Emission from  $^{31}\text{Ar}$  at ISOLDE*. Acta Physica Polonica B **47**, 747 (2016), URL <http://dx.doi.org/10.5506/aphyspolb.47.747>
- O. S. Kirsebom, H. O. U. Fynbo, A. M. Howard, and K. L. Laursen. *Applying new tools to old problems: experimental studies of resonances in  $^{12}\text{C}$* . Journal of Physics: Conference Series **569**, 012013 (2014), URL <http://dx.doi.org/10.1088/1742-6596/569/1/012013>
- K. L. Laursen, H. O. U. Fynbo, A. M. Howard, and O. S. Kirsebom. *Complete kinematics study of the  $p + ^{11}\text{B} \rightarrow ^{12}\text{C}$  reaction*. Journal of Physics: Conference Series **569**, 012073 (2014), URL <http://dx.doi.org/10.1088/1742-6596/569/1/012073>
- V. Pesudo, M. J. G. Borge, A. Moro, E. Nacher, L. Acosta, M. Alcorta, M. A. G. Alvarez, G. Ball, P. Bender, R. Braid, M. Cubero, A. di Pietro, J. Fernandez-Garcia, P. Figuera, M. Fisichella, B. R. Fulton, A. B. Garnsworthy, J. Gomez-Camacho, G. Hackman, O. S. Kirsebom, K. Kuhn, R. Krecken, M. Lattuada, J. Lay, G. Marqu nez-Dur n, I. Martel, D. Miller, M. Moukaddam, P. D. O'Malley, A. Perea, M. M. Rajabali, A. M. S nchez-Ben tez, F. Sarazin, V. Scuderi, C. E. Svensson, O. Tengblad, C. Unsworth, and Z. Wang. *Reaction of the Halo Nucleus  $^{11}\text{Be}$  on Heavy Targets at Energies Around the Coulomb Barrier*. Acta Physica Polonica B **45**, 375 (2014), URL <http://dx.doi.org/10.5506/aphyspolb.45.375>
- O. S. Kirsebom.  *$^{12}\text{C}$  and the triple- $\alpha$  reaction rate*. Journal of Physics: Conference Series **436**, 012072 (2013), URL <http://dx.doi.org/10.1088/1742-6596/436/1/012072>
- C. A. Diget, H. O. U. Fynbo, K. L. Laursen, K. O. Madsb l, L. J rgensen, O. S. Kirsebom, and K. Riisager. *Complete kinematics measurement of the  $^{11}\text{B}(p,\gamma)3\alpha$  reaction*. Journal of Physics: Conference Series **381**, 012116 (2012), URL <http://dx.doi.org/10.1088/1742-6596/381/1/012116>
- O. S. Kirsebom. *Decay of  $^{12}\text{C}^*$  into Three  $\alpha$  Particles*. Few-Body Systems **54**, 755–759 (2012), URL <http://dx.doi.org/10.1007/s00601-012-0441-z>
- M. Alcorta, M. J. G. Borge, M. Cubero, C. A. Diget, R. Dominguez-Reyes, L. Fraile, B. R. Fulton, H. O. U. Fynbo, D. Galaviz, S. Hyldegaard, H. B. Jeppesen, B. Jonson, O. S. Kirsebom, M. Madurga, A. Maira, A. Mu oz, T. Nilsson, G. Nyman, D. Obradors, A. Perea, K. Riisager, O. Tengblad, and M. Turri n. *Properties of resonances in  $^{12}\text{C}$  above the triple-alpha threshold*. Journal of Physics: Conference Series **312**, 092013 (2011), URL <http://dx.doi.org/10.1088/1742-6596/312/9/092013>
- O. Kirsebom, H. O. Fynbo, H. H. Knudsen, K. Riisager, B. R. Fulton, A. Laird, S. P. Fox, M. J. G. Borge, M. Madurga, O. Tengblad, M. Alcorta, B. Jonson, G. Nyman, H. Hultgren, R. Raabe, J. B scher, A. Saastamoinen, A. Jokinen, I. D. Moore, and J.  yst . *The  $^8\text{B}$  neutrino spectrum*. In *Proceedings of 11th Symposium on Nuclei in the Cosmos — PoS(NIC XI)*. Sissa Medialab (2011), URL <http://dx.doi.org/10.22323/1.100.0016>
- M. Alcorta, M. J. G. Borge, M. Cubero, R. Dominguez-Reyes, L. Fraile, B. Fulton, H. O. U. Fynbo, D. Galaviz, S. Hyldegaard, H. Jeppesen, B. Jonson, O. Kirsebom, M. Madurga, A. Maira, A. Mu  z, T. Nilsson, G. Nyman, D. Obradors, A. Perea, K. Riisager, O. Tengblad, M. Turri  n, M. Milin, T. Niksic, S. Szilner, and D. Vretenar. *Nuclear Structure of  $^{12}\text{C}$  from Break-up Studies in Complete Kinematics*. In *AIP Conference Proceedings*. AIP (2009), URL <http://dx.doi.org/10.1063/1.3232093>
- H. O. U. Fynbo, C. A. Diget, S. Hyldegaard, H. B. Jeppesen, H. H. Knudsen, O. Kirsebom, K. Riisager, M. Alcorta, R. Boutami, M. J. G. Borge, M. Madurga, O. Tengblad, S. Brandenburg, P. Dendooven, K. Jungmann, G. J. G. Onderwater, A. Rogachevskiy, M. Sohani, E. Traykov, H. W. Wilschut, J. B scher, P. V. Duppen, M. Huyse, R. Raabe, T. Eronen, J. Huikary, A. Jokinen, A. Kankainen, K. Per  j  rvi, I. Moore, A. Nieminen, H. Penttil, S. Rinta-Antila, A. Saastamoinen, Y. Wang, J.   yst  , B. Jonson, T. Nilsson, G. Nyman, K. Wilhelmsen, B. Fulton, S. Fox, and F. C. Barker. *The  $\beta$ -decay approach for studying  $^{12}\text{C}$* . Journal of Physics: Conference Series **111**, 012003 (2008), URL <http://dx.doi.org/10.1088/1742-6596/111/1/012003>

## Software

- F. Frazao and O. S. Kirsebom. *ketos* (2019), URL <https://pypi.org/project/ketos/>

M. Munch, O. S. Kirsebom, and J. Refsgaard. *Open R-matrix* (2018), URL <http://dx.doi.org/10.5281/zenodo.1174079>

M. Munch, J. H. Jensen, and O. S. Kirsebom. *simX* (2018), URL <http://dx.doi.org/10.5281/zenodo.1320121>